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EDITORIAL

On Being Narrowly Broad

When initially faced with the daunting prospect of being editor of *JEAB*, my first reaction was one of trepidation about doing something that might harm the journal. At the time of my election the journal was doing beautifully (as it is as I take the reins). Therefore, I have determined that the old adage, "If it ain't broke, don't fix it," is very good advice, and, by and large, I shall heed it. This editorial, then, will include no call for dramatic shifts in direction or style, but instead will briefly outline my view of the journal, what makes it unique, and how I hope it will remain so. Along the way, I shall acknowledge my support of innovations that were promulgated by previous editors and that have come to be important characteristics of *JEAB*.

Of course, one thing that makes the journal distinctive in the broader arena known as experimental psychology is expressed on the inside of the front cover of each issue: A main role of *JEAB* is the ". . . publication of experiments relevant to the behavior of individual organisms." This alone, however, would not and does not set *JEAB* apart. It did when the journal was founded, but now it is not uncommon to see in many journals experiments directed at the behavior of individual subjects. As one colleague observed recently, "*JEAB* has won. Individual-subject experiments are now acceptable in a wide range of psychological journals." Those who founded *JEAB* (and subsequently the *Journal of Applied Behavior Analysis* [*JABA*]) and nurtured it can take some pride in the fact that these types of experiments now are accepted in a broader realm.

If it is not its continuing emphasis on behavior of individuals that sets *JEAB* apart, what does make it distinctive? Consideration of the title of the journal provides some answers. The expression "experimental analysis of behavior" has come to mean certain things, only one of which is that behavior, by definition (see Johnston & Pennypacker, 1980), refers to activities of individual subjects. It also implies interpretive and methodological preferences based on the view that behavior is worthy of study in its own right and is not a mere reflection or index of processes occurring at some hypothetical level. As noted in an earlier editorial (Hineline, 1984), *JEAB* is a forum for a particular type of interpretation and theorizing that can be called "environment based." It is also founded on methods (cf. Bernard, 1865/1957; Johnston & Pennypacker, 1980; Sidman, 1960) in which reliability and generality of findings are assessed directly. These two characteristics (elaborated a bit below), together with the emphasis on individual subjects, are what set *JEAB* apart and give it its unique niche within modern experimental psychology.

"Environment-based" theorizing, developed in psychology expansively by Skinner (e.g., 1938, 1950, 1953, 1969, 1974) but having its roots much earlier (cf. Darwin, 1872/1962; Mach, 1883/1960; see Hineline, 1990, and Marr, 1985, for discussions), may be contrasted with "organism-based" interpretations. In the latter, explanations are based primarily on the operation of inferred structures in the organism (e.g., cognitive structures, personality traits, etc.). In environment-based interpretations, explanations are sought in the history of behavior–environment interactions, with the eventual goal being parsimonious, quantitative explanations based on a small number of principles. These principles are described in terms of factors that are subject (at least in principle) to direct experimental manipulation (hence the description "experimental analysis"). A good analogy is to Newtonian mechanics, where a small set of laws, based on directly measurable entities, provides an accurate account of the motion of objects. I hope *JEAB* will continue to emphasize environment-based explanation, not because it is necessarily "right" but because it is an approach with advantages worth exploring (see Zuriff, 1985).

Interpretations, of course, usually appear in discussion sections of research papers. It has been, and will continue to be, journal policy that investigators are given fairly wide latitude in discussing their results. This freedom, however, is not absolute; to take an

extreme example, interpretations based on supernatural causation will remain taboo. Nevertheless, those who prefer organism-based interpretations will be cajoled, but not required, to consider environment-based explanations in their discussions of results. Interpretations, no matter what their type, need to be carefully and unambiguously stated. As noted by both Catania (1984) and Hineline (1980), verbal behavior is, in most situations, our calculus as psychologists. A calculus based in mathematics has been useful in science partly because of its lack of ambiguity. A calculus based in verbal behavior also should be as unambiguous as possible. Other, older sciences suggest that rigorous and precise definition not only promotes the advance of knowledge but also helps prevent mistakes. Consequently, *JEAB* editors will continue the tradition of paying close attention to proper use of technical terms and to ambiguities inherent in everyday terms. This attention will apply to both interpretations and descriptions of procedures and results.

On the methodological side, "experimental analysis of behavior" implies direct demonstrations of reliability and generality rather than primary dependence on the methods of statistical inference. These demonstrations are based on intrasubject and intersubject replications made possible by rigorous experimental control, and as such set higher standards than mere statistical significance. This bias, which will remain, is based on the knowledge that statistical significance is silent with respect to replicability (reliability). We need to remember that, because probability values are based on the *assumption* that the null hypothesis is true, level of significance is not related in any formal way to likelihood of replication (i.e., that "statistically reliable" stretches the meaning of "reliable"; cf. Carver, 1978; Cohen, 1990; Dar, 1987; Meehl, 1978). Relying on statistical significance of differences of among-group averages presents an additional problem, that of straying from the subject matter (i.e., the behavior of individual subjects). Group statistical data can be highly useful when actuarial issues are of concern, but they offer less to a science aimed at the behavior of individuals. As Sidman (1990) noted recently, "... if a variable cannot be manipulated within an individual, and if intersubject variability cannot be reduced to the point where small groups show differences that are significant in magnitude or importance, then the use of statistical control will yield data that differ qualitatively from data produced by experimental control.... What I called 'basic' and 'engineering' research should not be confused; they yield different kinds of knowledge" (p. 191). *JEAB* will continue to promote the development of techniques that produce experimental control over behavior of interest. Results of statistical significance tests, then, will remain as ancillary information. They will not be treated as indicating that results are reliable.

Group-mean differences, of course, are not entirely irrelevant to understanding the behavior of individuals. A difference in group means indicates that, at a minimum, some subjects were affected by experimental manipulations. Such a difference, however, usually should be considered to be the starting point for an experimental analysis of individual-subject behavior, not an end product. Group means themselves also can be useful when they provide a *representative* summary of data from individuals. Representativeness should be established before a mean is used as a summary across (and, for that matter, within) subjects.

Acknowledging that significance tests are not indicators of reliability (in the usual sense of the term) means that authors must make the case in other ways. Another of my predecessors has dealt with this issue in an editorial (Zeiler, 1977), and the suggestions there will continue in force. To make judgments about the reliability of findings, readers must have relevant information. Included in this sort of information are, among others, indicators of variability, number of attempts at replication, criteria for claiming a replication, and evidence of strong experimental control. This last form of information could involve, in appropriate cases, the presentation of cumulative response records (e.g., cumulative records indicating appropriate temporal patterning of behavior may show that accepted standards of experimental control were established).

Over the past decade, perhaps partly in response to the calls issued by Zeiler (1977), Nevin (1980), Hineline (1984), and Fantino (1988), the range of topics covered by *JEAB* has broadened. Many experiments involving

human subjects have been reported. Topics usually thought of as cognitive, social, and ethological have appeared. This is a positive trend that I hope continues. Nowhere on the masthead of the journal is there any restriction about the type of behavior to be studied. Methods for rigorous experimental control of behavior in individual subjects certainly are not limited to psychophysics and operant conditioning. Nor should it be assumed that the only behavior of interest is that occurring in a behavioral steady state that can be eliminated by a reversal to original conditions. Individual-subject analyses of behavior in transition (what traditionally is referred to as learning and perhaps best studied as behavior change between two stable states) are welcome and encouraged, including studies of respondent (elicited) behavior. Over the last three decades, much of what has been published in the journal has involved studies of acquisition that have required intersubject rather than intrasubject replications. The literature on autoshaping in the 1970s, the literature on formation of equivalence classes in the 1980s, and many studies of behavior change that have appeared in *JABA* provide excellent examples of how research that requires between-subject comparisons can be accommodated in individual-subject paradigms. The upcoming special issue of *JEAB* on behavioral dynamics will, I hope, serve as a reminder to prospective authors that *JEAB* is a suitable vehicle for work on learning as well as for work on behavior at asymptote.

This editorial carries the title "On being narrowly broad." *JEAB*'s place in the psychological pantheon can be subsumed by this expression. The journal is "narrow" in that it promotes the study of individuals (not group averages), direct demonstrations of reliability and generality (not statistical significance), and environment-based theorizing. It is broad in that *any* behavioral phenomenon, from elicited to species-specific to sensory to developmental to operant/instrumental to social to cognitive and beyond, is welcome as a subject of experimentation. As noted earlier, the range of topics and types of subjects appearing in the journal has expanded over the past two decades; it is my hope that this expansion will continue.

To conclude, *JEAB* has welcomed, and will continue to welcome as its main fare, individual-subject analyses of virtually any behavioral phenomenon. The journal has been the major forum in the field of psychology for basic research aimed at understanding the behavior of individuals. I hope that authors who wish their work to be read and evaluated by a community of scholars who emphasize both behavior of individual subjects and relatively unambiguous interpretations will view *JEAB* as the publication outlet of choice.

Marc N. Branch
Editor

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